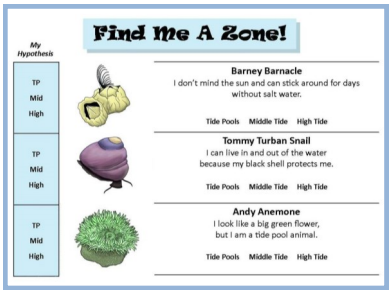


Lesson Overview:

After defining/reviewing the concepts of 'zonation', students will hypothesize which tidepool zone is best suited for specific intertidal species, based on written descriptions as part of a reading assignment. During the field trip, their hypotheses will be tested as students find tide pool species in different intertidal zones. As part of an evaluation activity, the process may be repeated upon your return to school.

Subjects:

Ecology and Reading

Preparation:

1. Photocopy page 3 *Find Me a Zone* for each student.

Time:

Pre-Visit Activity - 30 minutes
Field Trip Activity - 45 minutes
Evaluation Activity - 15 minutes

State of Oregon - Education Standards

4.2L.1 *Describe the interactions of organisms and the environment where they live.*

4.3S.1 *Based on observations identify testable questions, design a scientific investigation, and collect and record data consistent with a planned scientific investigation.*

5.1L.1 *Explain that organisms are composed of parts that function together to form a living ecosystem.*

5.2E.1 *Explain how the inter-dependence of plants, animals, and environment, and how adaptation influences survival.*

5.2L.1 *Based on observations and science principles, identify a question that can be tested, design an experiment or investigation, and identify appropriate tools. Collect and record multiple observations while conducting investigations or experiments to test a scientific question or* hypothesis.

Ocean Literacy Principle

***5 - d** and **h :** The ocean supports a great diversity of life and ecosystems.*

Sea-Crets: Hypothesize Me a Zone

Pre-visit Activity

1. Make photocopies and preparation as instructed in the sidebar.

2. Define the concept of zonation by discussing how different animals and plants are better suited to live in different environments, or zones. Explain that tide pools are divided into zones in which different species can be found. *(See page 2 for more resources)*

Hypothesis

An educated guess to predict the outcome of an event or experiment, that can be tested to prove whether it is right or wrong.

3. Review and discuss the process of making a hypothesis (making an educated guess). *Can students predict what the weather will be like tomorrow? How could they prove it? Can they predict if one sports team might win over another during a sports event?*

4. Hand out copies of page 3, *Find Me a Zone* to each student, and starting with *Barney the Barnacle,* model the activity:

a. Read the following with your students: "*Snug on the rock in my own little castle, I close the doors when the tide falls—no hassle*!"

b. Aid the students in breaking down the sentence description in order to hypothesize into which zone Barney will most likely be found. Prompt students with questions such as *Which zone might not see water for a number of hours?, etc.*

c. Ask students to circle the appropriate zone for *Barney the Barnacle:* High, Middle, or Tide Pool Zone.

5. Ask students to repeat step 4 for each species listed, individually completing the handout.

6. Tell students that they will have an opportunity to test their scientific hypothesis during a planned visit to a tide pool area.

Post-visit Evaluation

1. Upon returning to the classroom, evaluate student learning by re-issuing and having them complete the *Find Me a Zone* scavenger hunt handout (*page 3*) one more time.

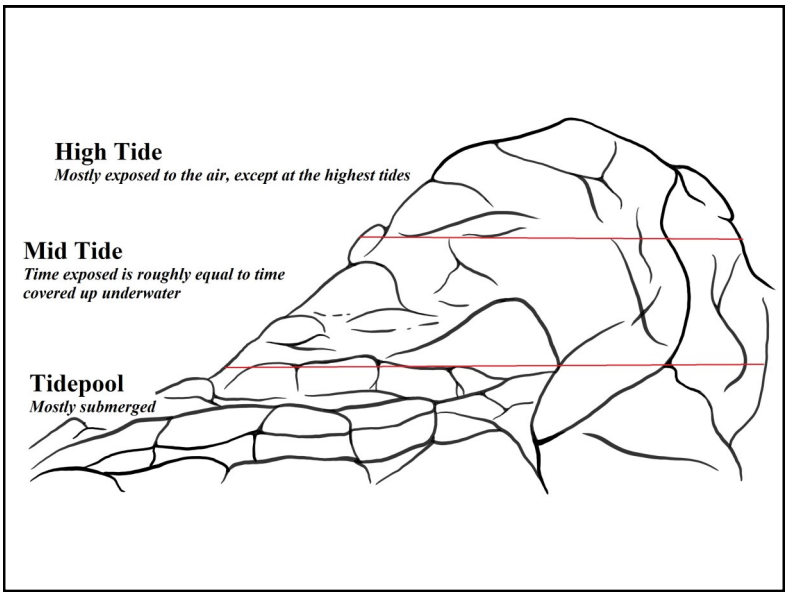
2. Compare and contrast their initial hypotheses with findings from actual observation.

Extensions:

- Ask students to make a hypothesis of an upcoming sports event.
- Use photos from the Intertidal Animal Scramble activity on the Yaquina Head website (or other sources) and ask students to make similar zonation hypotheses for other species.

Zonation

Zone: ***a distinct band in which a specific group of organisms live***



Challenges in the Intertidal

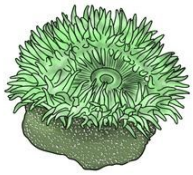
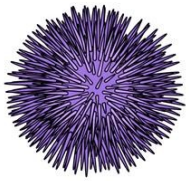
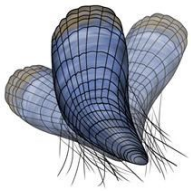
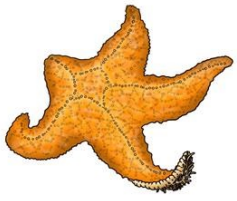
- Too much sunlight causes organisms to dry out; too little sunlight stunts growth and reproduction
- When organisms are exposed to the air, they can experience drastic temperature changes
- Freshwater falls as rain on animals used to living in saltwater
- Organisms must protect themselves from wave action by attaching to the rock or burrowing in sediment

Cobble Beach at exact low tide; timing changes daily.

Cobble Beach at high tide; intertidal is completely covered.

Name: Date:

Find Me A Zone!

My Hypothesis		
High Mid TP		**Barney Barnacle** Snug on the rock in my own little castle, I close the doors when the tide falls—no hassle! **Tide Pools Middle Tide High Tide**
High Mid TP		**Tommy Turban Snail** Wet or dry, I move slowly. My big black shell protects me. **Tide Pools Middle Tide High Tide**
High Mid TP		**Andy Anemone** Open, I look like a flower; closed, like a donut. Don't be fooled by my stillness; I'm a predator on the hunt. **Tide Pools Middle Tide High Tide**
High Mid TP		**Ursula Urchin** Burrowed in the rock, I love to munch on algae. I'll hug your finger if you gently touch me. **Tide Pools Middle Tide High Tide**
High Mid TP		**Martha Mussel** Upon the rocks, I live in beds, holding on with byssal threads. **Tide Pools Middle Tide High Tide**
High Mid TP		**Harold Hermit Crab** An empty snail shell makes a good home, protecting me as I roam. **Tide Pools Middle Tide High Tide**
High Mid TP		**Sally Sea Star** My five legs and hundreds of tube feet help me look for other animals to eat. **Tide Pools Middle Tide High Tide**
High Mid TP		**Stevie the Sculpin** I'm very good at blending in, so watch closely if you want to see me swim. **Tide Pools Middle Tide High Tide**